

***FlyBy Math™* Alignment**
To the Massachusetts Mathematics Curriculum Framework
Grade-Level Standards, November 2000

Number Sense and Operations Strand

Students engage in problem solving, communicating, reasoning, connecting, and representing as they:

Grade-Level Standard	<i>FlyBy Math™</i> Activities
8.N.3 Use ratios and proportions in the solution of problems in particular, problems involving unit rates, scale factors, and rates of change.	<p>--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.</p> <p>--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.</p>

Patterns, Relations, and Algebra Strand

Students engage in problem solving, communicating, reasoning, connecting, and representing as they:

Grade-Level Standard	<i>FlyBy Math™</i> Activities
8.P.1 Extend, represent, analyze, and generalize a variety of patterns with tables, graphs, words, and when possible symbolic expressions. Include arithmetic and geometric progressions, e.g., compounding.	<p>--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.</p> <p>--Predict the relative motion of two airplanes on given paths.</p>
8.P.4 Create and use symbolic expressions and relate them to verbal, tabular, and graphical representations.	--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.
8.P.5 Identify the slope of a line as a measure of its steepness and as a constant rate of change from its table of values, equation, or graph. Apply the concept of slope to the solution of problems.	--Interpret the slope of a line in the context of a distance-rate-time problem.
8.P.7 Set up and solve linear equations and inequalities with one or two variables, using algebraic methods, models, and/or graphs.	<p>--Represent distance, speed, and time relationships for constant speed cases using linear equations, and a Cartesian coordinate system.</p> <p>--Use tables, graphs, and equations to solve aircraft conflict problems.</p>
8.P.8 Explain and analyze—both quantitatively and qualitatively, using pictures, graphs, charts, or equations—how a change in one variable results in a change in another variable in functional relationships, e.g., $C = \pi d$, $A = \pi r^2$ (A as a function of r), $A_{\text{rectangle}} = lw$ ($A_{\text{rectangle}}$ as a function of l and w).	<p>--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.</p> <p>--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.</p>
8.P.9 Use linear equations to model and analyze problems involving proportional relationships. Use technology as appropriate.	<p>--Represent distance, speed, and time relationships for constant speed cases using linear equations, and a Cartesian coordinate system.</p> <p>--Use graphs to compare airspace scenarios for both</p>

	the same and different starting conditions and the same and different constant (fixed) rates.
8.P.10 Use tables and graphs to represent and compare linear growth patterns. In particular, compare rates of change and x- and y-intercepts of different linear patterns.	<p>--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.</p> <p>--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.</p> <p>--Interpret the slope of a line in the context of a distance-rate-time problem.</p>

Measurement Strand

Students engage in problem solving, communicating, reasoning, connecting, and representing as they:

Grade-Level Standard	<i>FlyBy Math™</i> Activities
8.M.1 Select, convert (within the same system of measurement), and use appropriate units of measurement or scale.	--Calculate and measure the position and time of simulated aircraft. Represent that motion using tables, graphs, equations, and experimentation.
8.M.4 Use ratio and proportion (including scale factors) in the solution of problems, including problems involving similar plane figures and indirect measurement.	<p>--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.</p> <p>--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.</p>
8.M.5 Use models, graphs, and formulas to solve simple problems involving rates, e.g., velocity and density.	<p>--Use the distance-rate-time formula to predict and analyze aircraft conflicts.</p> <p>--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.</p> <p>--Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.</p>

Data Analysis, Statistics, and Probability Strand

Students engage in problem solving, communicating, reasoning, connecting, and representing as they:

Grade-Level Standard	<i>FlyBy Math™</i> Activities
8.D.2 Select, create, interpret, and utilize the following tabular and graphical representations of data: circle graphs, Venn diagrams, scatterplots, stem-and-leaf plots, box-and-whisker plots, histograms, tables, and charts. Differentiate between continuous and discrete data and ways to represent them.	--Choose among tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.